

## Claims

- [001] A method for affinity management in a distributed computer system (100), the method comprising: providing an identifier for each of a plurality of addressing entities (311-315), wherein the identifier for each member of a group of addressing entities with an affinity is the same group identifier; determining the number of service providers (301-304) which are available to be addressed by an addressing entity to provide an instance of a service; managing the distribution of addressing entities to service providers by the following method: applying (205) a hash function to the identifier of an addressing entity to obtain a standard integer; dividing (206) the standard integer by the number of service providers and obtaining the modulus; selecting (207) a service provider by reference to the modulus; sending (208) the addressing entity to the instance of the service provided by the selected service provider.
- [002] A method as claimed in claim 1, wherein the step of determining the number of service providers is carried out periodically and the number of service providers is constant within a period.
- [003] A method as claimed in claim 1 or claim 2, wherein the method includes providing an index (203) of the available service providers referenced by modulus values.
- [004] A method as claimed in any one of claims 1 to 3, wherein if a selected service provider is unavailable, the addressing entity is sent to the next service provider in a predetermined order.
- [005] A method as claimed in any one of the preceding claims, wherein if a service provider fails, a process is activated to retrieve previously delivered addressing entities.
- [006] A method as claimed in any one of the preceding claims, wherein if a service provider fails, it can be reinstated after ensuring that there are no addressing entities with a group affinity in alternative service providers.
- [007] A method as claimed in any one of the preceding claims, wherein if a service provider fails, addressing entities sent to the service provider are re-distributed.
- [008] A method as claimed in any one of the preceding claims, wherein the distributed computing system is a messaging system, the addressing entities are messages and the service providers are clustered queue managers hosting instances of one or more cluster queues.
- [009] A system for affinity management in a distributed computer system, the system comprising: a plurality of addressing entities (311-315) each with an identifier, wherein the identifier for each member of a group of addressing entities with an

affinity is the same group identifier; a list of a plurality of service providers (301-304) which are available to be addressed by an addressing entity to provide an instance of a service; means for managing the distribution of addressing entities to service providers by using an algorithm with the following steps: applying (205) a hash function to the identifier of an addressing entity to obtain a standard integer; dividing (206) the standard integer by the number of service providers in the list and obtaining the modulus; and selecting (207) a service provider by reference to the modulus; and means for sending (208) the addressing entity to the instance of the service provided by the selected service provider.

- [010] A system as claimed in claim 9, wherein the list of service providers is updated periodically and the number of service providers on the list is constant within a period.
- [011] A system as claimed in claim 9 or claim 10, wherein a mechanism is provided to inform a workload manager of the service providers given in the list.
- [012] A system as claimed in any one of claims 9 to 11, wherein the system includes an index of service providers in the list referenced by modulus values.
- [013] A system as claimed in any one of claims 9 to 12, wherein if a selected service provider is unavailable, a workload manager sends the addressing entity to the next service provider in a predetermined order.
- [014] A system as claimed in any one of claims 9 to 13, wherein if a service provider fails, means are provided to retrieve previously delivered addressing entities.
- [015] A system as claimed in any one of claims 9 to 14, wherein if a service provider fails, means are provided to assure that there are no addressing entities with a group affinity in alternative service providers before the failed service provider is reinstated.
- [016] A system as claimed in any one of claims 9 to 15, wherein if a service provider fails, means are provided to re-distribute addressing entities sent to the service provider.
- [017] A system as claimed in any one of claims 9 to 16, wherein the distributed computing system is a messaging system, the addressing entities are messages and the service providers are clustered queue managers hosting instances of one or more cluster queues.
- [018] A computer program product loadable into the internal memory of a digital computer, comprising software code portions for performing, when said product is run on a computer, to carry out the invention of claims 1 to 10.